

**Notice of Allowability**

Application No.

09/923,377

Applicant(s)

WANG, SHAUN S.

Examiner

Jennifer Liversedge

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/17/2007.
2. ☒ The allowed claim(s) is/are 1-20 and 42-61.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material

5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

This Office Action is responsive to Applicant's response filed on August 17, 2007.

The amendment contains original claims: 2, 20, 43, 49 and 61.

The amendment contains amended claims: 1, 3-19, 42, 44-48 and 50-60.

Claims 21-40 (and 41, see Examiner's Amendment below) and 62-86 were withdrawn.

## **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Dennis Drehkoff on August 27, 2007.

The application has been amended as follows:

Dependent claim 41 should be designated as withdrawn. Dependent claim 41 depends indirectly from independent claim 21 which was withdrawn in an election/restriction requirement.

### ***Allowable Subject Matter***

Claims 1-20 and 42-61 are allowed.

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The following is an examiner's statement of reasons for allowance: the prior art fails to teach or suggest the limitations of the independent claims.

Independent claim 1 discloses a computer-implemented method for computing and outputting an indicated price, with adjustment for risk, of anticipated contract obligations comprising the steps of:

a) identifying an underlying risk vehicle comprised of one or more assets and liabilities,

b) assembling a series of potential future cashflow outcomes, consisting of cashflow values linked to their respectively paired probabilities, as a future probability distribution for that underlying risk vehicle,

c) sorting the series of outcomes by their ascending cashflow values, from the lowest listed as first to the highest listed as last, with those cashflow values still linked to their original respectively paired probabilities,

d) cumulating the respectively paired probabilities of the sorted series of outcomes so that the last such cumulated probability still linked to the highest cashflow value equals 1,

e) providing individual inversely-mapped results for those probabilities, by applying the inversion of the standard normal distribution to all of the cumulated probabilities,

f) selecting a lambda value equal to the market price of risk for the overall future probability distribution of the underlying risk vehicle,

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- g) adding the selected lambda value to obtain a shifted inversely-mapped result,
- h) creating transformed cumulative probability weights, by applying the standard normal cumulative distribution to each shifted result,
- i) decumulating the transformed cumulative probability weights of the sorted series of outcomes so that the first decumulated weight equals its own cumulated weight, the second decumulated weight equals the second cumulated weight minus the first cumulated weight, the third decumulated weight equals the third cumulated weight minus the second cumulated weight, and so on, continuing until the last decumulated weight equals the last cumulated weight minus the next-to-last cumulated weight,
- j) producing a set of weighted values, by multiplying the cashflow values to their respective decumulated probability weights;
- k) computing and outputting an undiscounted future indicated price for the underlying risk vehicle by adding all the weighted values in the set.

Dependent claims 2-20 are allowable as they follow from independent claim 1.

Independent claim 42 discloses a computer-readable medium for use with a computer means for computing and outputting an indicated price, with adjustment for risk, of anticipated contract obligations comprising the steps of:

- a) identifying an underlying risk vehicle, comprised of a group of one or more assets and liabilities,

b) assembling a series of potential future cashflow outcomes, consisting of cashflow values linked to their respectively paired probabilities, as a future probability distribution for that underlying risk vehicle,

c) sorting the series of outcomes by their ascending cashflow values, from the lowest listed as first to the highest listed as last, with those cashflow values still linked to their original respectively paired probabilities,

d) cumulating the respectively paired probabilities of the sorted series of outcomes so that the last such cumulated probability still linked to the highest cashflow value equals 1,

e) providing individual inversely-mapped results for those probabilities, by applying the inversion of the standard normal distribution to all of the cumulated probabilities,

f) selecting a lambda value equal to the market price of risk for the overall future probability distribution of the underlying risk vehicle,

g) adding the selected lambda value to obtain a shifted inversely-mapped result,

h) creating transformed cumulative probability weights, by applying the standard normal cumulative distribution to each shifted result,

i) decumulating the transformed cumulative probability weights of the sorted series of outcomes so that the first decumulated weight equals its own cumulated weight, the second decumulated weight equals the second cumulated weight minus the first cumulated weight, the third decumulated weight equals the third cumulated weight

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minus the second cumulated weight, and so on, continuing until the last decumulated weight equals the last cumulated weight minus the next-to-last cumulated weight,

j) producing a set of weighted values, by multiplying the cashflow values to their respective decumulated probability weights,

k) computing and outputting an undiscounted future indicated price for the underlying risk vehicle by adding all the weighted values in the set.

Dependent claims 43-61 are allowable as they follow from independent claim 42.

The primary difference between the claimed invention and the prior art is the applicability of the model to all probability distributions (rather than just normal or lognormal distributions), and the applicability to blending of assets and liabilities with both negative and positive values (rather than assets only which cannot be negative in value), in which the particular calculations are performed as outlined above taking into account these factors.

Prior art discloses the simulation of valuation of financial instruments (US Patent No. 6,061,662 to Makivic). Makivic discloses determining a price using a probability density calculated from historical data, in which a Metropolis algorithm is used to sample from the probability density, wherein the Monte Carlo simulation is based on a risk-neutral valuation, and wherein the price depends on a vector of state variables that is assumed to follow a Markov process. Further, the predetermined distribution is selected from Gaussian, Cauchy, Poisson jump, a combination thereof, as well as a

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histogram of historical data. The calculations for pricing are based on inputs related to assets. However, Makivic does not follow the calculation steps as details above as steps a- k; Makivic does not specify that the model is applicable to all probability distributions; and Makivic does not disclose where the model is applicable to liabilities as well as assets.

Further, prior art discloses determining optimal asset allocation utilizing simulation of cash flow (US Patent No. 6,055,517 to Friend et al.). Friend discloses simulating future cashflows for an asset allocation in order to avoid risks, in which a user defines weights to avoiding risk and maximizing rates of return. However, Friend does not follow the calculation steps as details above as steps a- k; Friend does not specify that the model is applicable to all probability distributions; and Friend does not disclose where the model is applicable to liabilities as well as assets.

Additional prior art (US Patent No. 6,360,210 B1 to Wallman) discloses managing risk is a portfolio of assets and liabilities. Wallman discloses a pricing mechanism that examines the risk for a given portfolio and prices the risk. Both assets and liabilities are input into the system and the system processes prices for shielding the portfolio from market risk. The pricing is performed and analyzed using value-at-risk and sensitivity algorithms and probabilistic analysis in computing the shielding cost. The analysis is disclosed as being capital asset pricing models, modern portfolio theory models, value-at-risk and sensitivity models for valuing portfolios. However, Wallman

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does not follow the calculation steps as details above as steps a- k and Wallman does not specify that the model is applicable to all probability distributions.

Non-patent literature published by the applicant of the current application includes "Insurance pricing and increased limits ratemaking by proportional hazards transforms" (Shaun Wang, 1995). In this paper, Wang discloses a risk-adjusted premium for pricing risks based on the proportional hazards (PH) transform. While the author concludes a method to calculate risk-adjusted premiums, which "can be used to equalize the risk loading for different risk classes or different lines of insurance", the author does not disclose the calculation steps as details above as steps a- k; nor specify that the model is applicable to all probability distributions; nor does the author disclose where the model is applicable to liabilities as well as assets.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

Applicant's arguments, filed August 17, 2007, with respect to 112 and 101 rejections have been fully considered and are persuasive. The 112 and 101 rejections have been withdrawn.



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**Conclusion**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kambiz Abdi can be reached at 571-272-6702. The fax number for the organization where the application or proceeding is assigned is 571-273-8300.

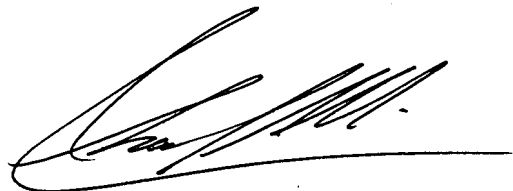
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jennifer Liversedge

Examiner

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Kambiz Abdi

Supervisory Patent Examiner

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